Course Assignment Details

"Moneyball" Analysis and Identifying Big Data and Analytics Applications (100 Points)

– Due January 24, 2016 at 11:55 PM CT

1. Using the "Analytical Competition" framework from <u>Competing on Analytics</u>, assess the status of the Oakland A's organization at the time of the <u>Moneyball</u> movie, i.e., the 2002 baseball season. (Hint: see chapter 2 and table 6-2 of <u>Competing on Analytics</u>.)
   a. How might Billy Beane have been more effective at advancing the Oakland A's capabilities as an "analytical competitor"?
2. Apply this same analysis and framework to an organization of your choice. What stage of analytical competition have they reached, and why?
3. Which functional or operational areas of this organization would likely hold potential for analytics? Why?
4. Submit your analysis paper in a single PDF document – approximately 3-4 pages of double-spaced text. Include your name and page numbers in the footer of all pages (e.g., Jane Smith, page 1 of 2). This analysis paper should not exceed four pages of double-spaced text. No abstract is required.

   [NOTE: page counts do not include cover page, abstract, references / citations or exhibits.]

Dashboard and Executive Summary (100 Points)

– Due February 7, 2016 at 11:55 PM CT

Read the case study, "Advantage Asset Advisor Funds." **A downloadable copy of the case is located on the Canvas learning platform.**

Analyze the firm's situation, Ms. Turner's questions and the data and reports that are available to support the firm's decision-making.

- Assess the dashboards in the case (Exhibits 1-3). What, if any, are their strengths and weaknesses?
- If you were joining the meeting to make recommendations to the chief marketing officer and chief sales officer, what improvements would you recommend for these existing dashboards? What additional information would you like to see?
- Develop a draft dashboard that you believe would provide more effective decision-making support for the productivity of the sales organization and the expansion, revision or termination of the KnowledgeSCORE program.

Formatting: Submit a single PDF document of your analysis and draft dashboard. The length of your case analysis, dashboard critique and dashboard draft should not exceed three (3) double-spaced pages of text (e.g., the "executive summary,"), one page for your draft dashboard, plus any annotated/new exhibits that are directly referenced in your executive summary. (You do not need to include copies of the original case exhibits, unless you modify them for illustrative purposes.) Include your name and page numbering on all pages (e.g., Billy Beane, page X of Y). No abstract is required.

[NOTE: page counts do not include cover page, abstract, references / citations or exhibits.]

Case Study Assignment – Final (150 Points)

- Due February 21, 2016 at 11:55 PM CT

For this assignment, students have two options:
1) Research and write a paper summarizing the predictive analytics applications in a specific industry and/or functional area of your choice (minimum of three thematic "cases"), **or**
2) Research and write an in-depth case study <u>and proposed solution</u> on a single organization of your choice.

Choose only one of these papers to complete, and communicate your choice of topic to the instructor <u>before the end of Session 4</u> (Jan. 31, 2016).

OPTION ONE: Case Study Collection Theme Paper

Students are to collect three case studies of organizations that have used analytics to improve an aspect of their performance that all have some common theme, and write a summary paper discussing overall themes and commonalities.

Part 1
Case studies may be from a variety of types of organizations (financial, advertising, manufacturing, online, service, acquisition, retention), or you may focus more specifically on an area of special interest or relevance to you. The majority of studies should be recent (i.e., more recent than the studies in Competing on Analytics, published 2007) and should contain enough detail to allow evaluation of the manner in which the use of analytics enabled the organizations to achieve productivity improvements and gain a competitive advantage.

In addition to *Competing on Analytics*, the recommended book by Eric Siegel, *Predictive Analytics* (especially Tables 1-9, following pg. 142) provides a comprehensive survey of applications, across a range of business, government and non-profit sectors as well as business functions.

You are encouraged to draw on the research resources available within the Northwestern University library system, including industry and academic publications and journals (e.g., ORMS Today, Harvard Business Review, Information Week, etc.) as well as topical items in the general press (e.g., Wall Street Journal).

You may also find interesting and useful case examples in the web sites of analytics and business intelligence vendors (e.g., software companies, big data and cloud services companies and strategy/specialist consultancies). However, please be skeptical of these materials, <u>and do not rely solely on vendor "marketing materials" for your case studies.</u>

Part 2
A summation of the case studies will display your understanding of the relationship between the theories presented in the readings and the real-life examples presented in the case studies. Questions to be addressed in the summation paper include, but are not limited to:

- What was the ultimate value of the analytics for the organizations?
- Which analytical models were chosen? How was the appropriate analytic approach selected?
- How were data collected, and how were data quality issues handled?
- What type of analytic competitors were the organizations before, and after, their use of analytics?
- Where did the organizations make improvements? The strategic level? Functional? Globally? (How well do your cases fit with the "Roadmap to Enhanced Analytical Competition"?)

Other learning points from the case studies should be included in the summation. The summation should begin with an executive summary of key learning points from your case collection.

Formatting: Submit a single PDF document of your Case Study Collection Theme paper, including an executive summary of your case theme (approximately 1 to 1 ½ pages), your three case studies (appx. 1 ½ pages text each, plus exhibits), and your analysis and summary of learning points (appx. 4 pages). The text of your case study paper should not exceed 10 double-spaced pages, plus exhibits. Include your name and page numbering on all pages (e.g., Billy Beane, page X of Y). No abstract is required.

[NOTE: page counts do not include cover page, abstract, references / citations or exhibits.]

OPTION 2: In-Depth Case Study

Students may elect to write a single, in-depth case study on any organization of their interest that is advancing its analytical capabilities. Although it is possible that this in-depth case might be completed using only publically available sources, it is unlikely that you will be able to do a good job on this assignment, unless you have direct access to the organization's management team and insights regarding the organization's strategy, operations, key managers and their work implementing predictive analytics.

If you access and use any internal or proprietary information from your chosen organization, you must obtain the organization's permission to share your case-study research and insights.

The in-depth case study should include the following components, at a minimum:

Organizational background and context:
- What does the organization do? In which industries or sectors does it compete? What are it's distinctive advantages / disadvantages?
- 15% weight in grading

Experience competing on analytics:
- Where is the organization deploying predictive analytics capabilities to improve its performance?
- How well have they done? How effectively and fully have these capabilities been embedded into the organization's operations and culture?
- 15% weight in grading

Key problem statement
- Where are the missed or underserved opportunities for advancing the organization's ability to compete on analytics? (To what extent is this a problem of vision or execution?)
- In which areas of the organization's strategy and operations do you see the greatest potential for further improvements? (What are the key organizational problems that are not being adequately addressed? How can predictive analytics help? And to what extent?)
- What organizational barriers or resistance needs to be overcome (e.g., executive sponsorship, investment funding, analytical capabilities, etc.)
- 30% weight in grading

Your recommended solution, i.e., your Road Map for Competing on Analytics:
- To which important strategic and/or operational questions does this organization need to apply predictive analytics? Why?
- Who should be responsible for driving these efforts? And how should this person (or these persons) proceed?
- What resources would you need to make your proposed Road Map initiatives successful?
- 40% weight in grading

Format: Submit a single PDF document of your In-Depth Case Study paper. The text of your case study paper should not exceed 10 double-spaced pages, plus exhibits. Include your name and page numbering on all pages (e.g., Billy Beane, page X of Y). No abstract is required.

[NOTE: page counts do not include cover page, abstract, references / citations or exhibits.]

Survey Design and Implementation – Final (150 Points)

– Due March 13, 2016, 11:55 PM CT

In this assignment students are to create a survey research topic, survey instrument, survey implementation plan, data management and integration plan and a draft dashboard for reporting the survey data (and other relevant data). This assignment does not require the survey to be administered.

First, you will decide on your research topic. What is it that you would like to know? And how will the survey data augment other sources of data that may be available? Who can provide you with that information? (A brief overview of your research topic is due before the end of Session 8, i.e., not later than Feb. 28, 2016.) The crafting of your research topic will receive 30% weight in grading.

In addition to the research topic and key questions that you are planning to answer with your survey, your final paper will include four additional components:

1. A sampling plan appropriate to the population of interest. This plan identifies and describes your population of interest and how you intend to have adequate number and representation to make generalizing statements about the population. (20% weight)

2. A survey instrument appropriate for the selected mode of delivery. This instrument will reflect the mode you intend to field the survey, and the respondent's completion time must not exceed five minutes. A justification of the selected mode should be included with the survey. Questions should be well crafted, be in appropriate form, and provide adequate information to answer the research questions you have posed. (20% weight)

3. A plan for handling missing or poor quality data, and an outline of other data that might be incorporated with the survey data. This plan outlines how you intend to enhance the survey data with other operational or third-party data; and how you plan to deal with missing or poor quality data. The impact of poor quality data on your ability to answer your research topic should be addressed, which will in turn inform your imputation methodology. (20% weight)

4. A sketch of a slide (or dashboard) that will make effective use of some of your survey data (and other data). This dashboard will demonstrate how you would effectively convey the results of the survey. (10% weight)

Format: Submit a single PDF document, including all five components of the assignment. The main body of your survey paper should not exceed eight double-spaced pages; exhibits such as example survey questions and your dashboard sketch

do not count towards the page limit. Include your name and page numbering in the footer of all pages (e.g., John Doe, page X of Y).

BONUS POINTS - Communicating Analytical Insights

➢ Slide design and critique; one key analytical insight from empirical data (10 points; or 15 points for video)
➢ Dashboard design and critique; multiple analytical insights from empirical data (20 points; or 30 points for video)
➢ Submit from January 25, 2016 through March 11, 2016.
➢ Submissions before January 25th or after March 11th will not be eligible for bonus points.

Select an analytical slide and/or a dashboard from an organization that interests you. The organization may be any business, government agency or non-profit group that gives you permission to publically share the slide and/or dashboard. The slide and/or dashboard may also come from a publication such as the Wall Street Journal, Economist or an industry publication. (However, please don't submit "infographics.")

Critique the analytical slide / dashboard. The following questions may be useful in your analysis and critique:
• Why did you select this slide / dashboard? What is the key conclusion or insight that is being conveyed?
• How effective and persuasive is the slide/dashboard? Why?
• How reliable are the underlying data?
• Are the underlying analytical models appropriate?
• How well does the slide/dashboard convey a measure of certainty (or confidence) in its conclusion(s)?
• Are there important contextual factors or other variables missing, particularly omissions that could alter the conclusion of the slide (or the conclusions of the dashboard)?
• How well does the dashboard do on the "Thirteen Common Mistakes in Dashboard Design"? (Hint: see chapter 2 of Stephen Few's book.)
• How could you improve this slide or dashboard?

Post your slide/dashboard and analysis to THE CAFÉ DISCUSSION BOARD. Your bonus post write-up should not exceed 500 words, plus any graphics that you are critiquing.

"EXTRA" BONUS POINTS:

In addition to the written analysis and bonus post (described above), **record and post a video** of your slide / dashboard submission, your analysis and critique, and your suggestions for improvements to THE CAFÉ DISCUSSION BOARD. Your written post can be your script, and **your video post should not exceed five minutes** in total running time.